

REMARKS

The Examiner objected to claims 3-11 and 16-17 as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The Examiner rejected claims 1-2 and 12-14 under 35 U.S.C. §103(a) as allegedly being unpatentable over Liu *et al.* (U.S. Patent No. 6,380,095), in view of Flanner *et al.* (U.S. Patent No. 6,653,734).

The Examiner rejected claim 15 under 35 U.S.C. §103(a) as allegedly being unpatentable over Liu, in view of Flanner, in further view of Wolf *et al.*, *Silicon Processing for the VLSI Era*, Vol. 1, Lattice Press (1986).

Applicants respectfully traverse the §103 rejections with the following arguments.

35 U.S.C. §103(a)

The Examiner rejected claims 1-2 and 12-14 under 35 U.S.C. §103(a) as allegedly being unpatentable over Liu *et al.* (U.S. Patent No. 6,380,095), in view of Flanner *et al.* (U.S. Patent No. 6,653,734).

Applicants respectfully contend that claim 1 is not unpatentable over Liu in view of Flanner, because Liu in view of Flanner does not teach or suggest each and every feature of claim 1. For example, Liu in view of Flanner does not teach or suggest the feature “(b) determining a **first yield** of the first plurality of deep trenches” of claim 1 (bold emphasis added). More specifically, neither Liu nor Flanner mentions determining any yield of any structure. Based on the preceding arguments, Applicants respectfully maintain that claim 1 is not unpatentable over Liu in view of Flanner, and that claim 1 is in condition for allowance.

Moreover, Liu in view of Flanner does not teach or suggest the feature “(c) **if the first yield** of the first plurality of deep trenches is not within a pre-specified range of a target yield, forming a **second plurality of deep trenches**” of claim 1 (bold emphasis added). More specifically, as admitted by the Examiner in bullet 7 of the Office Action, “Liu does not expressly disclose Applicants’ step (b)” which is the quoted step (c) above. Moreover, Flanner also does not teach the feature of step (c) of claim 1, because in Flanner there is no mentioning of forming a second plurality of deep trenches **if the first yield** of the first plurality of deep trenches is not within a pre-specified range of a target yield as claimed in step (c) of claim 1 (bold emphasis added).

In bullet 7 of the Office Action, the Examiner argued that “Flanner teaches that faceting on the walls of hard mask layer (104) can result in an undesirable enlargement of the trench to be etched (column 4, lines 47-60; Figure 4)” and “One who is skilled in the art would be motivated

to select an etching composition that produces the desired angle range, such as altering Liu's first etching step to produce a smooth hard mask layer sidewall". In response, Applicants note that, although it is implied that there allegedly would be motivation to select an etching composition that produces the desired angle range, as stated by the Examiner, but in both Liu and Flanner, there is still no mentioning of forming a second plurality of deep trenches **if the first yield** of the first plurality of deep trenches is not within a pre-specified range of a target yield (bold emphasis added). Applicants note that step (c) is a conditional step which is performed only when the condition is satisfied (i.e., the first yield is not within the pre-specified range of the target yield).

Based on the preceding arguments, Applicants respectfully maintain that claim 1 is not unpatentable over Liu in view of Flanner, and that claim 1 is in condition for allowance.

The Examiner rejected claim 2 under 35 U.S.C. §103(a) as allegedly being unpatentable over Liu *et al.* (U.S. Patent No. 6,380,095), in view of Flanner *et al.* (U.S. Patent No. 6,653,734). Since claim 2 depends from claim 1, which is in condition for allowance as argued above, Applicants contend that claim 2 is likewise in condition for allowance.

Moreover, Liu in view of Flanner does not teach or suggest the feature "determining a **second yield** of the second plurality of deep trenches" of claim 2 (bold emphasis added). More specifically, neither Liu nor Flanner mentions determining any yield of any structure. Based on the preceding arguments, Applicants respectfully maintain that claim 2 is not unpatentable over Liu in view of Flanner, and that claim 2 is in condition for allowance.

Moreover, Liu in view of Flanner does not teach or suggest the feature "**if the second yield** of the second plurality of deep trenches is not within the pre-specified range of a target yield, forming a **third plurality of deep trenches**" of claim 2 (bold emphasis added). More specifically, the Examiner admitted in bullet 8 of the Office Action that, "As to claim 2, Liu does

not expressly disclose Applicants' claimed limitation". Moreover, Flanner also does not teach the feature of claim 2, because in Flanner, there is no mentioning of forming **a third plurality of deep trenches if the second yield** of the second plurality of deep trenches is not within the pre-specified range of the target yield as claimed in claim 2 (bold emphasis added).

In bullet 8 of the Office Action, the Examiner argued that "Flanner teaches that faceting on the walls of hard mask layer (104) can result in an undesirable enlargement of the trench to be etched (column 4, lines 47-60; Figure 4)" and "One who is skilled in the art would be motivated to select an etching composition that produces the desired angle range, such as altering Liu's first etching step to produce a smooth hard mask layer sidewall". In response, Applicants note that, although it is implied that there allegedly would be motivated to select an etching composition that produces the desired angle range, as stated by the Examiner, but in both Liu and Flanner, there is still no mentioning of forming **a third plurality of deep trenches, if the second yield** of the second plurality of deep trenches is not within the pre-specified range of the target yield (bold emphasis added). Applicants note that the cited step of claim 2 is a conditional step which is performed only when the condition is satisfied (i.e., the second yield is not within the pre-specified range of the target yield).

Based on the preceding arguments, Applicants respectfully maintain that claim 2 is not unpatentable over Liu in view of Flanner, and that claim 2 is in condition for allowance.

The Examiner rejected claim 12 under 35 U.S.C. §103(a) as allegedly being unpatentable over Liu *et al.* (U.S. Patent No. 6,380,095), in view of Flanner *et al.* (U.S. Patent No. 6,653,734). Since claim 12 depends from claim 1, which is in condition for allowance as argued above, Applicants contend that claim 12 is likewise in condition for allowance.

The Examiner rejected claim 13 under 35 U.S.C. §103(a) as allegedly being unpatentable over Liu *et al.* (U.S. Patent No. 6,380,095), in view of Flanner *et al.* (U.S. Patent No. 6,653,734). Since claim 13 depends from claim 12, which is in condition for allowance as argued above, Applicants contend that claim 13 is likewise in condition for allowance.

The Examiner rejected claim 14 under 35 U.S.C. §103(a) as allegedly being unpatentable over Liu *et al.* (U.S. Patent No. 6,380,095), in view of Flanner *et al.* (U.S. Patent No. 6,653,734).

Applicants respectfully contend that claim 14 is not unpatentable over Liu in view of Flanner, because Liu in view of Flanner does not teach or suggest each and every feature of claim 14. For example, Liu in view of Flanner does not teach or suggest the feature "etching a bottom portion of the hard mask opening ... such that the bottom portion of the hard mask opening **has a greater lateral width** than a top portion of the hard mask opening" of claim 14 (bold emphasis added).

This quoted feature comes from original claim 17 and is not taught or suggested by prior art as admitted by the Examiner in bullet 17 of the Office Action. More specifically, in bullet 17 of the Office Action, the Examiner admitted that "the prior art fails to teach or suggest that the bottom portion of the hard mask opening has a greater lateral width than a top portion of the hard mask opening".

Based on the preceding arguments, Applicants respectfully maintain that claim 14 is not unpatentable over Liu in view of Flanner, and that claim 14 is in condition for allowance.

The Examiner rejected claim 15 under 35 U.S.C. §103(a) as allegedly being unpatentable over Liu, in view of Flanner, in further view of Wolf *et al.*, *Silicon Processing for the VLSI Era*, Vol. 1, Lattice Press (1986). Since claim 15 depends from claim 14, which is in condition for

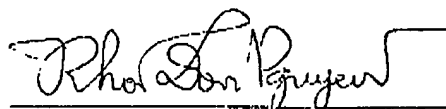
allowance as argued above, Applicants contend that claim 15 is likewise in condition for allowance.

CONCLUSION

Based on the preceding arguments, Applicants respectfully believe that all pending claims and the entire application meet the acceptance criteria for allowance and therefore request favorable action. If the Examiner believes that anything further would be helpful to place the application in better condition for allowance, Applicants invites the Examiner to contact Applicants' representative at the telephone number listed below. The Director is hereby authorized to charge and/or credit Deposit Account No. 09-0456.

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